patients' treatment adherence and persistence. **METHODS:** A systematic review of the literature was performed in MedLine/PubMed, Cochrane Library, ISI WOK, MEDES, IBECS, CSIC, Google Scholar (2002-2012) to identify articles referred to direct COPD cost and treatment persistence and adherence. Based on the direct cost data extracted, the annual cost difference between an adherent and non-adherent and a persistent and non-persistent patient in Spain was estimated. Costs were updated to €, 2012. **RESULTS:** A total of 48 articles were included (9 Spanish; 39 international). The mean annual direct cost of a COPD patient in Spain varies between €301 and €4.226, depending on the publication. Patients' adherence and persistence on COPD treatment and their annual costs was analyzed in 3 articles (no Spanish publications identified). Multiple inhaled treatments and devices of complex use contribute to poor adherence and persistence and to higher medical resources use and more exacerbations. Treatment adherence and persistence implies a 9% and 3% decrease in mean annual direct cost of a COPD patient, respectively, while non-adherence and non-persistence means an increase of 5% and 13%. The difference between the mean annual direct cost associated to adherent and to non-adherent patient varies from €43 to €601 (depending on the selected publication) and rises up to €89 to €1.674 in severe COPD patients. A difference between annual direct cost in persistent and non-persistent patient was estimated in €47 to €666 that reached €99 to €1.855 in severe COPD patients. **CONCLUSIONS:** Treatment adherence and persistence information is scarce. Therapeutic strategies improving patient adherence and persistence may optimize outcomes contribute to COPD costs contain.

PRS17

THE BURDEN OF PNEUMONIA IN MALAYSIA, INDONESIA AND PHILIPPINES

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OBJECTIVES: The Casemix databases contain clinical costing information from hospitals in Malaysia, Indonesia and the Philippines. The objective of this study was to determine burden of pneumonia in these three countries. **METHODS:** Pneumonia cases occurring in a single year were identified using ICD10 codes, J10-J18. Patients were further categorized into community-acquired pneumonia (CAP) or hospital-acquired pneumonia (HAP); CAP if they had 1) a primary diagnosis of pneumonia, or 2) secondary diagnosis of pneumonia with primary diagnosis of a respiratory condition; HAP cases had pneumonia in any of the secondary diagnosis fields with non-respiratory primary diagnoses. Descriptive analysis was performed to ascertain patient age groups, mean age, mean length of stay (LOS) and case fatality rates (CFR). **RESULTS:** A total of 15,851 pneumonia cases in year 2010 for Indonesia and Philippines and 2011, for Malaysia were included in the analysis. The mean age of patients was 47.5 years in Malaysia, 36.6 years in Indonesia and 23.5 years in Philippines. There was a preponderance of CAP cases among the very young and the very old while HAP cases were more likely to occur in older persons. The overall CFR of all pneumonia hospitalizations was 11.5% for Malaysia, 5.2% for Indonesia and 3.6% for Philippines. The cost of hospitalization was USD 1,177.50, USD 1,103.80 and USD 254.30 in Malaysia, Indonesia and Philippines respectively. The mean LOS in days was 9.2, 8.0 and 6.6 in the three countries, respectively. **CONCLUSIONS:** Our study is the first to utilize these databases to study and compare the burden of pneumonia across three countries in Asia. The CFR and LOS varied in each of the countries likely due to a variety of reasons including differences in socio-economic conditions, patterns of infection as well as health system differences. In conclusion, pneumonia is significant burden in the South East Asian countries studied.

PRS18

COST AND COST-EFFECTIVENESS ANALYSES FOR MODERATE AND SEVERE COPD PATIENTS TREATED UNIQUELY WITH TIOTROPIUM 18 MCG OD FOR TWENTY-FOUR MONTHS

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OBJECTIVES: To evaluate cost and cost-effectiveness of tiotropium monotherapy administered for 24 months (18 mcg die) in patients suffering from mild-to-moderate and severe chronic obstructive pulmonary disease (COPD). **METHODS:** A recent published study showed that tiotropium monotherapy enables a significant minimization of morbidity in two groups of patients corresponding to predicted FEV1 baseline values ≤ 50% (A) and > 50% (B). Clinical outcomes (days in hospital, visits in general ward, cycles of systemic steroids, cycles of antibiotics and maintenance therapy drugs) were evaluated from the Italian NHS perspective. In order to perform cost-effectiveness analysis, FEV1 value, available for each patient, was converted in SGRQ score using a published multivariate linear model; then utilities were obtained through the Ståhl equation. **RESULTS:** Results from comparison between 24 months of standard therapy and subsequent 24 months of tiotropium monotherapy show that hospitalization cost, which represents the driving treatment cost, drops from 74.1% to 67.3% (A) and from 64.5% to 31.6% (B) of the total cost; differently maintenance therapy cost increases but it is more than offset by the savings accruing from the shortening of hospitalization. Furthermore, cost-effectiveness results reveal a mean saving of 216 € (A) and 900 € (B) other than a mean gain of 0.07 QALY(A) and 0.03 QALY(B). Dominance of tiotropium calculated only with patients completing treatment course reveal that in almost 30% (A) and 37% (B) of subjects tiotropium strategy is dominant while only in 2% (A) and 7% (B) of cases are associated to costs increment and worsening on quality of life. **CONCLUSIONS:** These results suggest that adoption of tiotropium as unique treatment in selected mild-to-moderate and severe COPD patients yields significant costs savings and has a beneficial effect on evaluated quality of life.

PRS19

DOUBLING OF HEALTH CARE COSTS AMONG ASTHMA PATIENTS WITH COPD DIAGNOSIS AND ITS ASSOCIATED CO-MORBIDITIES IN A CLAIMS DATABASE IN THE UNITED STATES

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OBJECTIVES: To estimate health care costs for asthma patients with and without a COPD diagnosis. **METHODS:** Asthma patients with and without diagnosed COPD were selected from the HealthCore Integrated Research Database covering administrative claims from approximately 27.6 million people in the USA. The index event was a patient's first exacerbation defined as oral corticosteroid prescription fills or emergency department visits or inpatient visits with a primary diagnosis of asthma. Eligibility criteria were ≥1 asthma diagnosis, ≥1 exacerbation and 12 months of continuous health plan enrolment on each side of the index date. Total all-cause and asthma-related direct health care costs for 12 months before and after the index date were calculated for all patients and those with and without a COPD diagnosis. **RESULTS:** A total of 94,883 patients met all eligibility criteria, of these 15,127 (15.9%) had both asthma and COPD diagnoses. The mean patient age was 41.6 years and 62.4% were female. Co-morbid conditions were more common among asthma patients with a COPD diagnosis. Asthma-related direct costs represented 25-30% of all-cause direct health care costs for all patients. Among asthma patients, COPD and its associated co-morbidities roughly doubled all-cause and asthma related direct health care costs: mean annual pre-index all-cause health care costs were $20,012 (COPD diagnosis) versus $8,938 (no COPD diagnosis); mean annual pre-index asthma related costs were $5,623 (COPD diagnosis) versus $2,600 (no COPD diagnosis). Mean annual post-index costs were almost unchanged: all-cause costs of $21,692 (COPD diagnosis) versus $10,787 (no COPD diagnosis) and asthma-related costs of $5,242 (COPD diagnosis) versus $3,016 (no COPD diagnosis). **CONCLUSIONS:** The economic burden of asthma among patients with a COPD diagnosis in a US claims database is twice as high as those without a COPD diagnosis. Further research could adjust for the effects of age on the prevalence of co-morbidities among the different groups.

PRS20

THE IMPACT OF SMOKING ON HOSPITAL COSTS IN TIMES OF CRISIS; AN ADDITIONAL BURDEN TO THE VULNERABLE GREEK HEALTH CARE SYSTEM

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OBJECTIVES: Smoking has a tremendous impact on public health and has been a cause of major concern in Greece for more than twenty years. In times of economic recession when household income drops and health spending is decreasing, the demand for health services is transferred to the public sector. In light of the above, the aim of this study was to measure the number of smoking-related hospitalizations and the additional hospital costs for the treatment of smoking-attributable diseases. **METHODS:** A prevalence-based disease specific approach was used for the calculations. Greek-specific smoking-attributable fractions (SAFs) were calculated for all smoking-related diseases, coded according to the International Classification of Diseases ICD-10. Smoking attributable morbidity was obtained by applying the SAFs to all public hospital admissions for 2011. Total hospital costs associated with smoking were calculated by applying the smoking-attributable admissions to each DRG rate. **RESULTS:** For Greece, lung cancer (C33-C34), bronchitis and emphysema (J40-J42, J43) presented the highest disease-specific SAF with a value of 88.4% and 88.1% respectively. In 2011, smoking was responsible for 199,028 hospital admissions (8.9 % of total). Smoking-attributable hospital costs, based on the current pricing DRG system, has reached 400,011,801€ representing 7.7% of public hospital budgets. Ischemic heart disease (I20-I25) was found to be the main cost driver (90.3 million €), followed by other circulatory diseases (I00-I09, I26-I51) (55.8 million€) and pneumonia, influenza (J10-J18) (52.6 million €). **CONCLUSIONS:** Despite evidence of a decreasing trend, smoking is still a considerable public health issue in Greece and has a great impact on public health care system. Vigorous efforts have been implemented to promote a smoke-free environment and to enforce existing anti-smoking legislation however the Greek society still experiences a high proportion of smoking-attributable admissions and hospital treatment costs. The findings of this study further corroborate a call for stronger support of cost-effective tobacco control policies.

PRS21

IMPACT OF CHRONIC PAIN ON HEALTH CARE COSTS IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE AS COMPARED TO OTHER CHRONIC DISEASES

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OBJECTIVES: Surveys have found high rates of pain medication use among COPD patients. However, few data exist on how chronic pain affects health care utilization. We examined how chronic pain affects direct medical costs in COPD and a matched cohort of patients with other chronic diseases. **METHODS:** We conducted a retrospective analysis using claims data from one managed care system. COPD patients were matched by age, sex, insurance type, and encounter type to persons with other chronic conditions but without COPD [Alzheimer's, atrial fibrillation, cancer, kidney disease, acute myocardial infarction, diabetes, heart failure, ischemic heart disease, rheumatoid/osteoarthritis (RA/OA), and stroke]. Chronic pain was indicated by pain-associated diagnoses, procedures for pain interventions, or prescription fills for pain medications. **RESULTS:** The study cohort (7,952 COPD patients, 15,904 non-COPD) was 58% female; mean age, 69. A higher percentage of COPD patients were chronic users of any pain medication (41.2% vs 31.5%, P<0.0001). The only

chronic disease with a greater use of pain medications was RA/OA (44.8% vs 41.2%, P<0.0001). COPD patients had more chronic use of short-acting opioids (24.2% vs. 15.1%, P<0.0001) and long-acting opioids (4.4% vs. 1.9%, P<0.0001). Among COPD patients, those with chronic pain had higher mean annual direct cost [$24,261 vs. $10,390 (p<0.0001)] which was largely attributable to increased hospitalizations (42.7% vs 25.4%, p<0.0001). By comparison, the mean total medical cost for the matched cohort was $17,681 for those with chronic pain compared to $6,543 for individuals without chronic pain (P<0.0001). Pain-related utilization was approximately 20% of COPD patients' annual direct cost. **CONCLUSIONS:** COPD patients have increased prevalence of and utilization for chronic pain as compared to all other chronic illnesses except RA/OA. Individuals with chronic disease and chronic pain have more than double the cost of those without chronic pain, and this difference is even higher among individuals with COPD.

PRS22

COSTS OF COPD IN FRANCE: A NATIONAL DATABASE ANALYSIS

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OBJECTIVES: To describe the direct costs to society of COPD per severity grades using the "Echantillon Generaliste de Beneficiaires"(EGB). EGB is a database which contains all health care resources used by a random 1/97 permanent sample of the French population covered by the national health care insurance system. **METHODS:** Several algorithms were developed to identify patients with COPD and to distinguish patients between four severity grades (1-4) based on health care consumption. These algorithms were based on age, rate and history of hospitalizations, treatments and tests received by the individuals. Exacerbations as well as their severity were identified through both antibiotics/corticosteroids drugs prescribed and hospitalizations. Total health care costs were calculated and a case-control approach was then used to estimate the cost of COPD. Exacerbations costs were calculated through a linear regression analysis including age and gender. **RESULTS:** Based on the 10,715 COPD patients identified in the EGB, its prevalence was estimated to 4.2% of the population beyond 40 years. The mean annual overall direct health care cost in this population was estimated to be €9,382. Annual average costs were €7,628; 10,770, 14,979 and 20,747 for severity grade 1-4 (severity data-base defined) respectively. The yearly cost of COPD itself was 5,516€: 45.5% related to hospital care and 20.0% to pharmaceuticals (6.0% to long-acting bronchodilators). The average exacerbation cost was €1,664 (SD: €86.6). The global economic burden of COPD in France was therefore estimated over €7 billions (4% of the national health care expense). **CONCLUSIONS:** Our study provides new solutions to estimate the burden of COPD in France using existing national databases. It confirms that COPD is associated with significant economic burden and the striking direct relationship between the cost of care and severity of the disease.

PRS23

HEALTH CARE RESOURCES UTILIZATION AND ASSOCIATED COSTS IN PATIENTS WITH COPD WITH OR WITHOUT ASTHMA: A RETROSPECTIVE, POPULATION-BASED OBSERVATIONAL STUDY

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OBJECTIVES: Chronic Obstructive Pulmonary Disease (COPD) is a highly prevalent chronic inflammatory disease. Some COPD patients show a co-diagnosis of asthma (COPD-A). This real-life observational study assessed the frequency of exacerbations, the use of health care resources and their associated costs in patients with COPD only and COPD-A. **METHODS:** Medical records from 6 Primary Care (PC) and one general hospital were reviewed and data from 2011 were collected from COPD and COPD-A patients aged 40 year or older who met specific inclusion/exclusion criteria. Main study variables were demography, co-morbidities, exacerbations and resources utilization. **RESULTS:** A total of 1210 COPD and 102 COPD-A, mean age (% male) 71.8 (85.5) and 71.2 (65.7) years, respectively, were included. Mean co-morbidity burden was similar in both groups with 7.9 and 7.8 diseases per patient. Most frequent co-morbidities (% in COPD; % in COPD-A) were dyslipidemia (63.0; 60.8) and arterial hypertension (59.5; 62.7) whereas the proportion of exacerbations (%) were 35.0 and 42.2, respectively. Mean number of exacerbations per patient per year was 1.2 in COPD and 1.6 in COPD-A. The frequency of severe exacerbations (%) requiring hospitalizations was 0.4 and 0.7, while those requiring oral corticosteroids was 24.4 and 33.0, respectively. Mean per patient, per year health care resources costs (Euro) were 2152.2 and 2207.5 for PC-associated costs, and 1361.6 and 1754.3 for specialist care-associated costs, respectively. **CONCLUSIONS:** Exacerbations are frequent complications in COPD and COPD-A patients. Both groups show high proportion of co-morbidities and use of health care resources which were higher in the COPD-A group. Health care-related costs are high and are mainly related to hospitalizations and drug therapy.

PRS24

ECONOMIC BURDEN IN DIRECT COSTS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) IN TURKEY: A PAYOR PERSPECTIVE

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OBJECTIVES: COPD has a major burden on Turkey's health care system. It leads to high mortality, morbidity and frequent use of health care resources. This study determined the total direct health care costs for the management of COPD patients with differing degrees of disease severity. The study also aimed to find the key cost drivers in the management of COPD in Turkey. **METHODS:** The methodology was based on a study conducted by European Respiratory Society in which Turkey and 11 other countries had been included. COPD patients were recorded from a territary care hospital in 2012. One-year costs were identified by applying cost data to medical information obtained by medical records. The cost analysis was based on cost of illness methodology. Costs included those for medications, laboratory and diagnostic tests, outpatient visits and hospital stays. **RESULTS:** There were 612 patients recruited. Patients were categorized by GOLD classification: 14.29% GOLDI, 15.28% GOLDII, 38.21% GOLDIII, 32.23% GOLD IV. The median of hospitalization day was 9 days. 36.1% of patients were rehospitalized in 90 days. The mortality rate was 3.1% because of exacerbation. The mean total direct costs was €4,135.60 per patient in a year. The total annual cost was correlated with disease severity. Hospitalization contributed the major portion of cost and also correlated with disease severity. The average outpatient cost was € 98.62, hospitalization cost including intervention was €1,548.56, laboratory and diagnostic tests cost were €103,03, comorbidity and complication cost were €1.493,88, medication cost with side effects were €903,59. **CONCLUSIONS:** There is a significant correlation between the cost of COPD and disease severity with hospitalization leading to disease exacerbation being a major contributor to cost. The keys to reducing health care costs lie beneath reducing the frequency of exacerbations and disease severity. As expected, the highest cost component was hospitalization, comorbidity and complication cost respectively.

PRS25

PAEDIATRIC TUBERCULOSIS - COSTS TO THE IRISH HEALTH CARE PAYER

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OBJECTIVES: Ireland currently administers a universal BCG vaccination programme to infants. In order to assess the cost effectiveness of this programme, it is vital to have accurate cost estimates of the burden of tuberculosis (TB) illness in infants. The aim of the current study was to cost the diagnosis and treatment of an episode of the following health states; pulmonary TB, extrapulmonary TB, TB meningitis and latent TB, from the health care payer's perspective. The cost of contact tracing per primary case of TB was also estimated. **METHODS:** Decision trees were constructed to reflect typical episodes of care in the diagnosis and treatment of each health state. Resource use and unit cost data were applied to each node in the decision tree. The probabilities of events occurring were derived from the literature and expert clinical opinion. Main costs included were inpatient medical/surgical costs, pediatrician outpatient appointments, medications, laboratory tests and x-rays. Each health state included a cost for a Directly Observed Therapy programme. Direct medical costs were calculated and the 2012 price year was used. **RESULTS:** The direct medical costs of diagnosing and treating a case of pulmonary TB, extrapulmonary TB, TB meningitis and latent TB were estimated to be approximately €8153, €12224, €15752 and €894 respectively. The main drivers in the costs are the length of hospital stay and the number of pediatrician visits. The cost of contact tracing per primary case of TB was estimated to be approximately €4,248, which was based on a mean number of 9.4 contacts examined per primary TB case. **CONCLUSIONS:** To our knowledge this is the first investigation of costs associated with paediatric TB within the context of the Irish health care setting and will allow for a more robust estimation of the cost effectiveness of BCG vaccination programmes, which will benefit the health care payer.

PRS26

PHARMACOECONOMIC ASSESSMENT OF DIFFERENT TACTICS OF COPD TREATMENT IN RUSSIA

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OBJECTIVES: Comparative pharmacoeconomic assessment of COPD therapy of patients in GOLD 2-3 stages in Moscow health care system. **METHODS:** Retrospective analysis of 130 cases during 1 year routine practice of patients with COPD in Moscow outpatients departments. Basic therapy strategies were obtaned: 1) monotherapy with indacaterol (14 pts. Low # of pts is because of the product was launched less than year ago); 2) monotherapy by tiotropium (33 pts), 3) fixed combination LABA + ICS (38 pts); 4) tiotropium plus fixed combination of LABA and ICS (45 pts). Cost of illness via calculation of direct medical costs on diagnostic, hospitalization, treatment of main disease and complications based on Federal Standards of COPD treatment and regional tariffs on cervices was estimated. Data on prices on medical products were obtained from State Register of medical products and www.aptechka.ru. **RESULTS:** The most expencive strategy is management of group 4 - 86.5 KRUR/pt/year (1 Euro - 40 RUR) where 67% are costs on base drugs and 31% are hospitalization expenses. Usage of fixed combinations LABA + ICS is comparable with monotherapy by tiotropium, total costs are 47 and 49 KRUR/pt/year accordingly. But if the reason of main part of the costs in group 3 is hospitalization due to exacerbation - 69%, for group 2 - 61% are expenditures on tiotropium. The most preferable is treatment of group 1 - 32847 RUR/pt/year, where 55% - part on indacaterol, 42% - hospital treatment, 3% - urgent care. **CONCLUSIONS:** In spite of high price, indacaterol is the most economic preferable product for basic COPD treatment of patients in GOLD 2-3 stages

PRS27

PREDICTING HEALTH CARE COSTS IN ASTHMA USING THE EQ-5D INDEX SCORE

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OBJECTIVES: To predict health care costs in asthma using the EQ-5D health-related quality-of-life (HRQoL) index score. **METHODS:** We extracted data from the 2000-03 Medical Expenditure Panel Survey (MEPS) on adult respondents who had EQ-5D index scores. Asthma patients were identified using ICD-9 (=493) and self-report on disease (n=3,783). To account for non-random selection of positive spending, the